



Ship Manpower Analysis & Requirements Tools



Bob Bost
BostJR@navsea.navy.mil



Dennis White
whitegd@nswc.navy.mil



Beth Plott
bplott@maad.com

GOAL:

Provide a design process/tool set that allows engineers or evaluators to assess ship manpower & workload requirements for future combatants

Before Any Metal is Bent!

Develop a scaleable architecture permitting manpower analyses for varying warfighting postures; execution of multiple missions; ship organization & team structures; changes in ROCs/POEs; in-port work activities

The Big Picture



Copyright © 1999 United Feature Syndicate, Inc.
Redistribution in whole or in part prohibited.

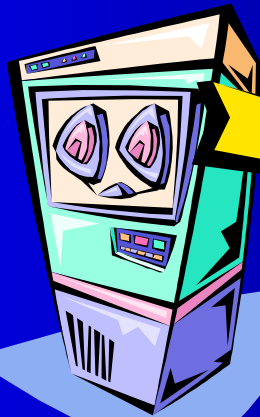
In order to avoid this fate, we need to provide the tools and capabilities to support the process

APPROACH

Work With Existing Systems

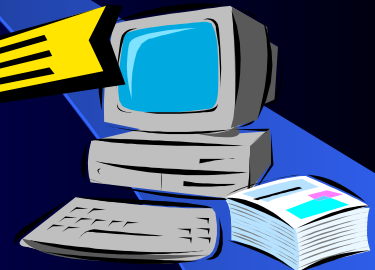
Develop New
Solutions

That Work
Together



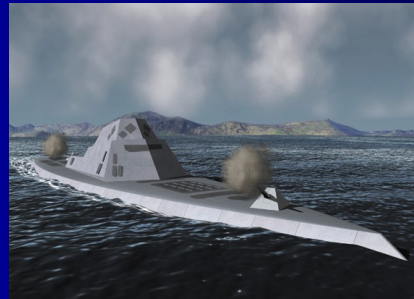
**Manpower
Ship Design**

Maintenance Models

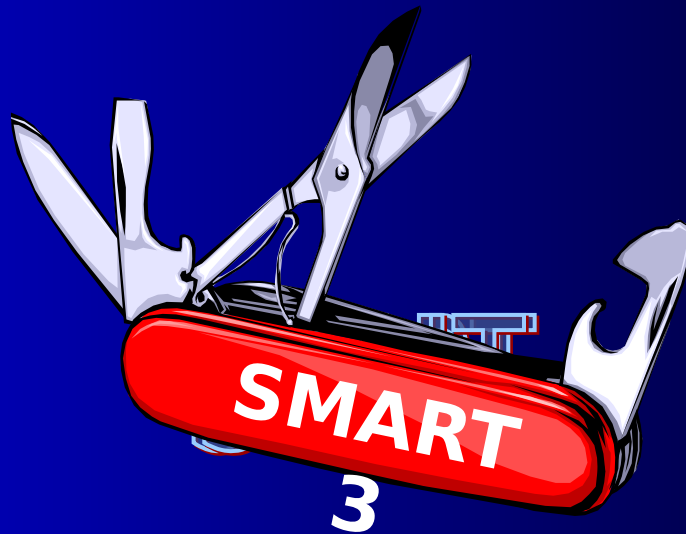


SMART


**To Evaluate New
Acquisitions**



Leverage



SMART Challenge

- What is the *BEST* crew composition for a new system?
 - Skills
 - Size
 - Cost
-  Minimize cost
Minimize crew size
Minimize number of different jobs
Minimize workload
- Complications!
 - Early answers required
 - Fast turn-around required
 - Range of missions and environments

Features



- **Customers:**

- **Program Managers (PEO(S))**

- **As well as designers**

- **Stochastic Maintenance Model (PM, CM, FM)**

- **Data Organizer**
- **Stochastic OM Model**

- **Scenario Based to show simultaneity**

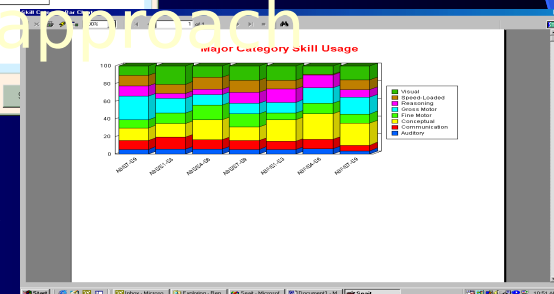
- **Skill based**

PM = Preventive Maintenance
CM = Corrective Maintenance
FM = Facilities Maintenance
OM = Operational Manning

SMART Approach

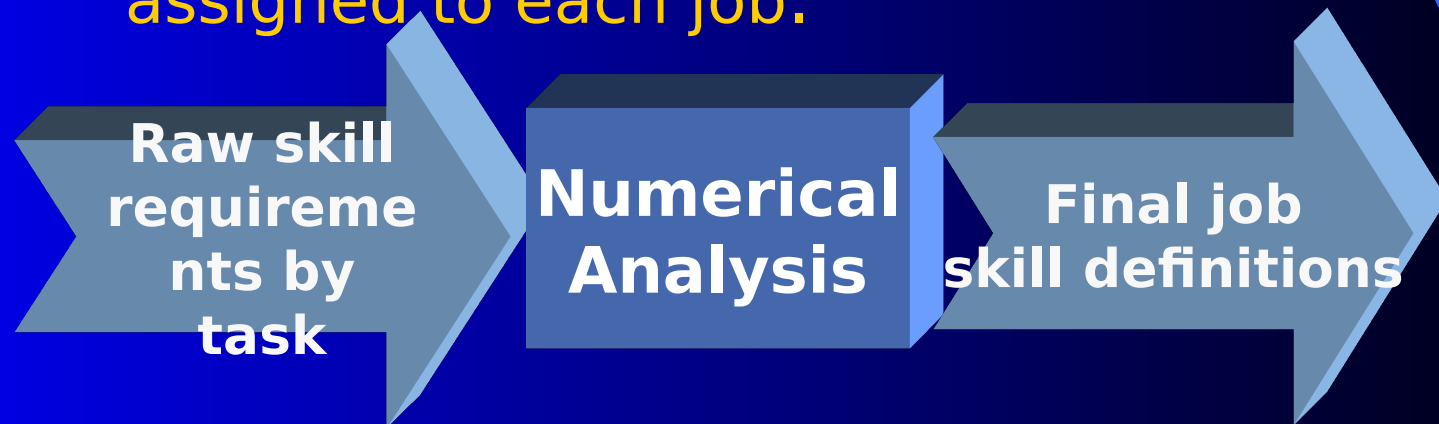
- Focus on skills needed to perform tasks
- Requirements based
 - Assigned to jobs
- Stochastic Analysis
 - Automatic Model
- Apply iterative, “what-if” analysis

analytical



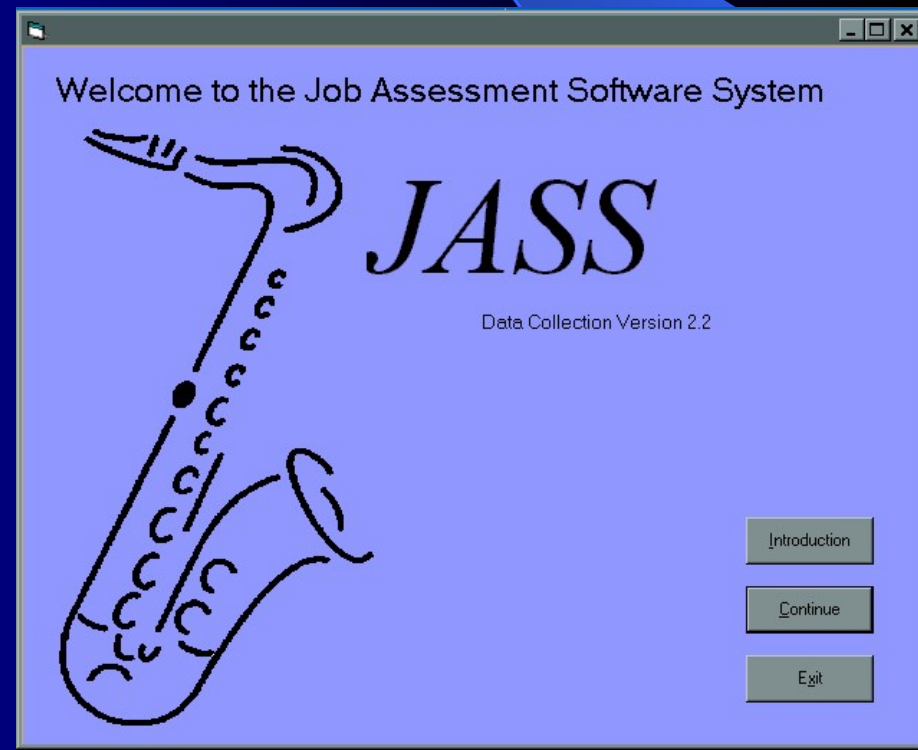
SMART Features

- Jobs are Described by Skill Requirements
 - Jobs will be composed of skill groupings, using current Navy profiles as a starting point.
 - Responsibilities are driven out of the tasks assigned to each job.



Skill Determination

- Based on Fleishman's Skill Taxonomy

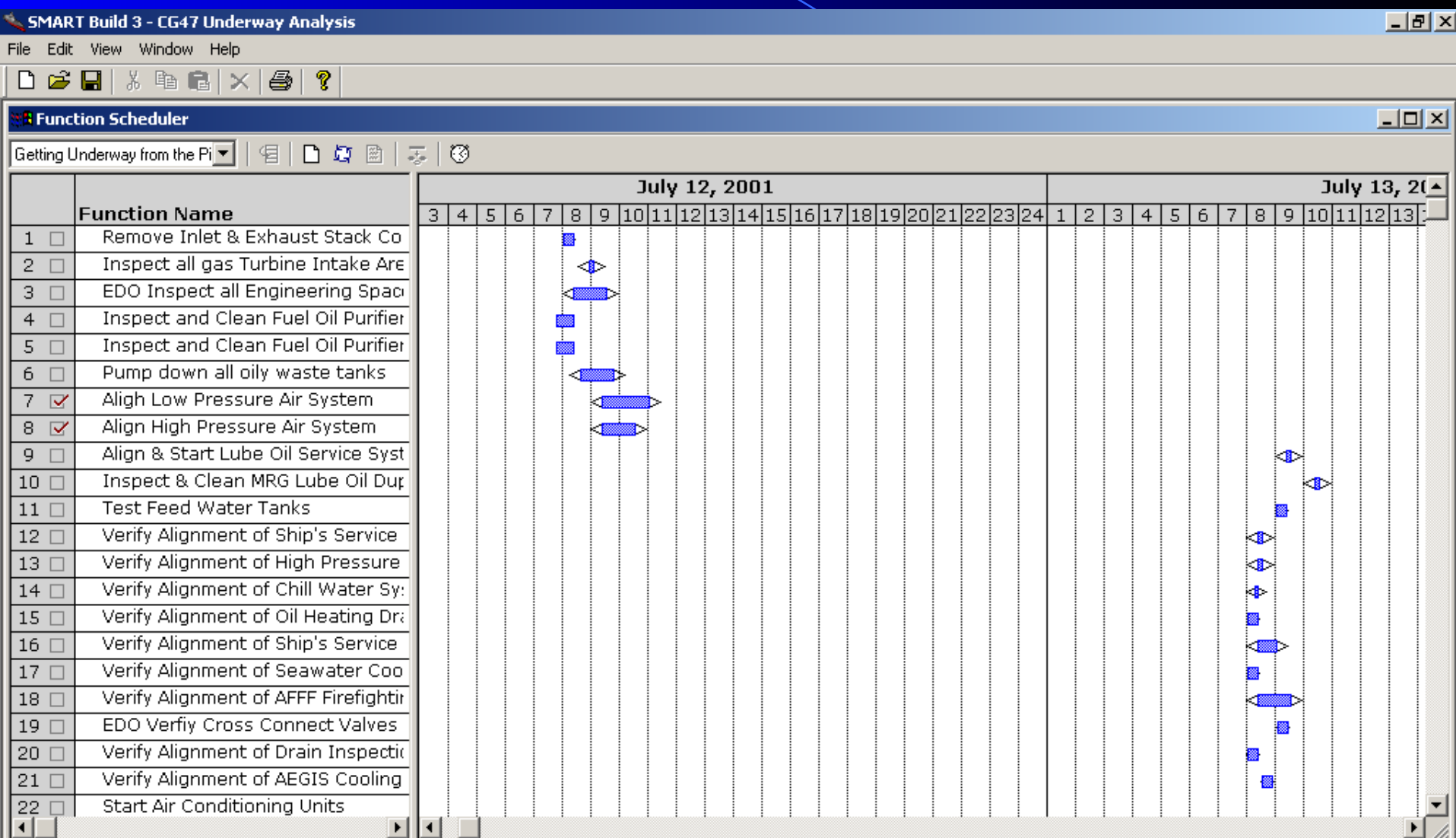




Skill Examples

- ORAL COMPREHENSION
- WRITTEN COMPREHENSION
- ORAL EXPRESSION
- WRITTEN EXPRESSION
- MEMORIZATION
- PROBLEM SENSITIVITY
- ORIGINALITY
- FLUENCY OF IDEAS
- FLEXIBILITY OF CLOSURE
- SELECTIVE ATTENTION
- SPATIAL ORIENTATION
- NEAR VISION
- FAR VISION
- NIGHT VISION
- VISUAL COLOR DISCRIMINATION
- PERIPHERAL VISION
- DEPTH PERCEPTION
- GENERAL HEARING
- WRIST-FINGER SPEED
- FINGER DEXTERITY
- MANUAL DEXTERITY
- ARM-HAND STEADINESS
- MULTI-LIMB COORDINATION

Gantt Charting Feature



SMART Features

- Comparison of required crew characteristics to existing jobs (Rank & Rating)
 - Developed and stored skill profiles for existing 115 jobs

Function/Task
skill
requirements

Existing
inventory
skill
definitions

The screenshot shows a software window titled "Assign Crew Members". It contains several fields and tables for managing crew assignments.

Fields at the top:

- Choose a Scenario: Lower RIB
- Choose a Function: Man the Boat & Fantail
- Task Name: Line Handlers & Deck Hand

Instructions below the fields:

Automated Functions or Tasks will not show up in this dialog box
This function has been decomposed into tasks. Crew members must be assigned to each task.

Buttons: "Add New Personnel" (top right), ">>" (between tables), "<<" (between tables), ">>" (bottom right).

JobID	JobTitle
BM/E1-E3	Boatswains Mate
OS/E7-E9	Operations Specialist
QM/E7-E9	Quartermaster
SN	Seaman

Job ID/Rank	Job Title	# Req
SN	Seaman	6

JobID	JobTitle
-------	----------

**Best
Match**

Assign Crew Type

SMART Build 3 - CG47 Underway Analysis

File Edit Define Run Results Options Utilities View Help



Assign Crew Members

Choose a Scenario: Getting Underway from the Choose a Function: Remove Inlet & Exhaust St

Automated Functions or Tasks will not show up in this dialog box

Add New Personnel

Personnel That Meet or Exceed Required Skill Set

Job ID/Rank	Job Title
TM/E7-E9	Torpedomans Mate
TM/E4-E6	Torpedomans Mate
TM/E1-E3	Torpedomans Mate
STG/E7-E9	Sonar Technician - Surface
STG/E4-E6	Sonar Technician - Surface
STG/E1-E3	Sonar Technician - Surface
SN	Seaman
SM/E7-E9	Signalman
SM/E4-E6	Signalman
SM/E1-E3	Signalman
SK/E7-E9	Storekeeper

Personnel New to Analysis That Meet or Exceed Required Skill Set

Job ID/Rank	Job Title

Personnel that can Perform the Task

Job ID/Rank	Job Title	# Req
FN	Fireman	1
GSM/E1-E3	Gas Turbine - Mechanical	1
GSM/E4-E6	Gas Turbine - Mechanical	1

>>

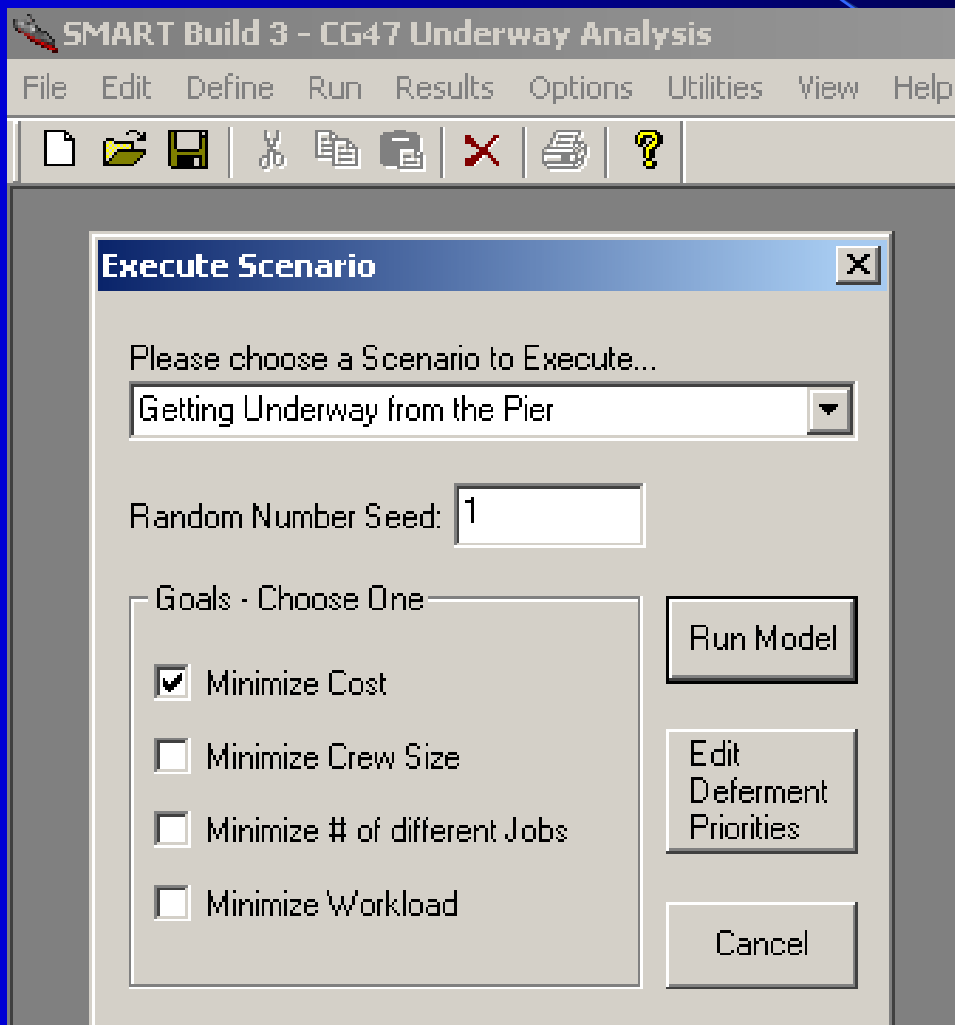
<<

>>

OK

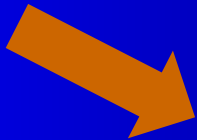
Cancel

Optimization Options



Designers & Recruiters

SMART



SKILLS



Rate, Rating, NEC



**Recruiting
Classification**

Occupational Standards Cross-Referencer

PRELIMINARY

First Goal: Gap Analysis

- Macros compare the text in the occupational standards to the list of OUS functions that are supported.

Status

**Part of ONR Capable Manpower FNC
-DTOOLS (Cancelled)**

Build2

- **Undergoing Validation**

Build3

- **Initial Design Complete - Ready
for Review, Validation**



Bob Bost

BostJR@navsea.navy.mil



Dennis White

whitegd@nswc.navy.mil



Beth Plott

bplott@maad.com

540.653.2811